Exercise 1 Crescent City Landfill (Overview)

History of Site and Environs

Began as a burn dump in 1950's.
Regulations In 1970's closed burn dump operation.
1972, site continued as a dump and cover operation.
Through legislation in 1975, Dept of Fish and Game and Dept of Parks and Recreation began evaluation to acquire Lake Earl wildlife area, to protect significant wildlife resources in area.
In early 1980's acquisition of wildlife areas began and now hold 10,000 Ac. of lands. These two agencies control ~ 5,000 Ac. each. Dept of Parks and Recreation controls the lands surrounding the LF on three sides.
These lands are currently unclassified.

Physical Features of Site

Surface deposits of well-sorted sand dune deposits.
Marsh deposits 5-20' thick of interbedded peat and clays underlay these.
Sands underlay the marsh deposits.
Two aquifers (water bearing) strata are in the upper and lower dune sand strata.
The lower aquifer is an important source for domestic water.
Irrigation and livestock water is taken from the upper aquifer.
Initial testing showed surface water contamination has occurred from landfill operations, primarily from surface drainages discharging into east marshes.
Initial groundwater tests indicated organic chemicals were present in groundwater at the south and east sides of the landfill. Leachate signs were found in wells to the south and west.

- VOC's Volatile Organics
- Elevated concentrations of Chloride alkalinity-bicarbonate-Chemical Oxygen Demand (COD), iron, calcium, Total Dissolved Solids, magnesium.

Biota

The site is in a high biological diversity area, both for plants and animals. Numerous endangered, threatened and protected species are found in the area. These are not necessarily **on** the site.
3 sensitive plant species were found on the site.

- Menzies Wallflower
- Sand Dune Phacelia
- Wolf's Evening Primrose

The active and stable dune fields are colonized by assorted native dune plant species. Ground covers and shrubs occupy the dunes while forests occupy the dune ridges. Sitka Spruce, shore pine, willow and wax myrtle make up these forests.

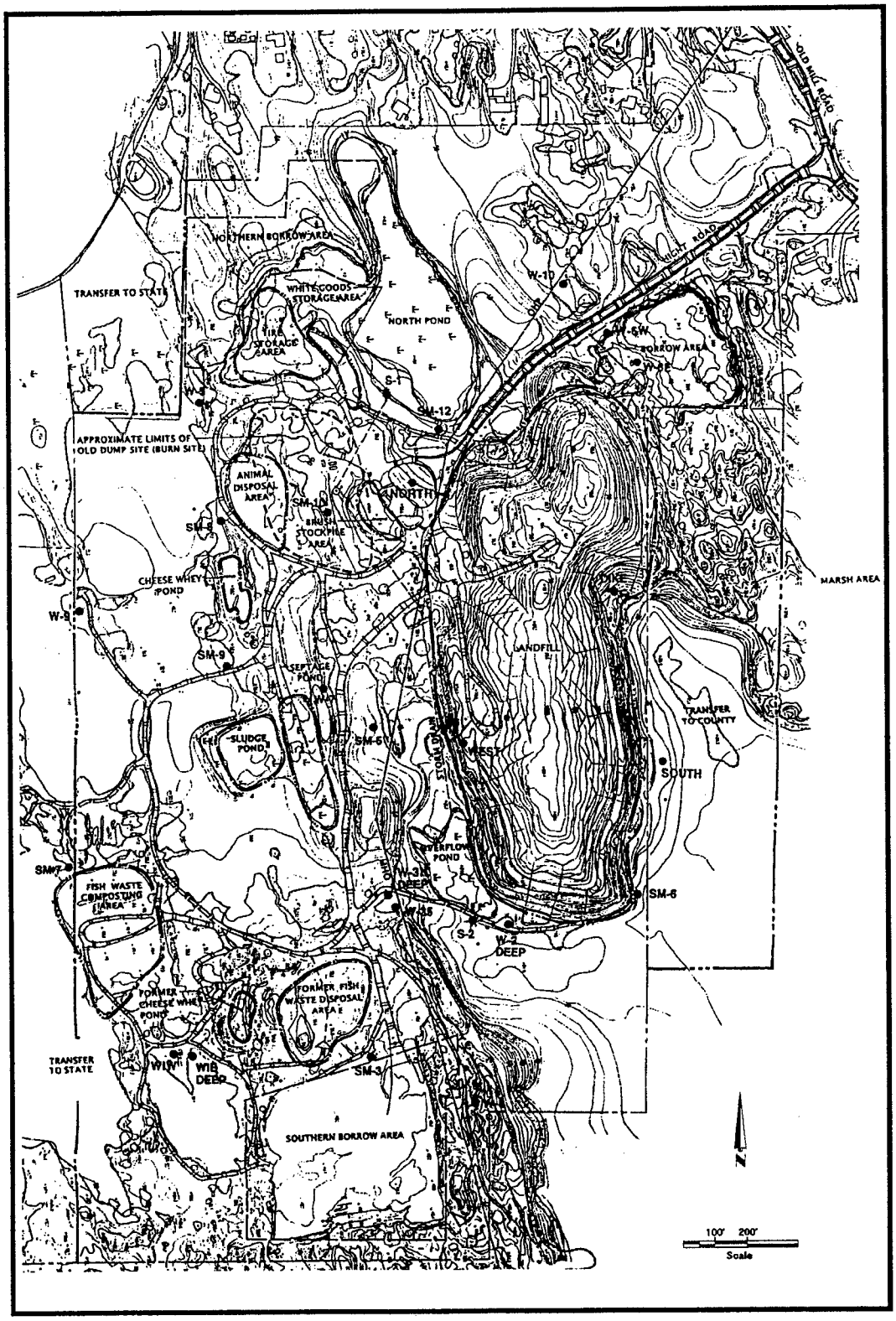
Wetlands between the dunes support sedges, rushes, silver weed and grasses, Alder trees. Open ponds support yellow pond lily buttercup, nyad, mare's tail and duck weed.
Most of the wetlands are naturally occurring.
Area M is a man-created wetland and is identified by CDFG as a wetland. US Army Corps of Engineers does not consider the artificially created wetlands as "regulated."
North and Beaver Ponds provide habitat for animals.
Deer and bear live on the uplands along with rabbit, hare, squirrel, rats, mice, gophers etc. Mink, river otter, and muskrat occupy ponds and wetlands.
Birds occupy the site including kestrels, 6 species of hawk, prairie and peregrine falcons, 5 species of owl and golden and bald eagle.
Reptiles include snakes, lizards, turtles frogs and toads, salamanders and newts.
Great many of these species are Federally, and California Threatened or Endangered or Special concern categories.
Lands bordering three sides of CCLF are owned by California Dept of Parks and Recreation totaling ~ 5,000 Ac. Calif. Dept. of Fish and Game owns land on the east side of Old Mill Road north and east to Lake Earl. A land exchange has placed land to the east side of the landfill into its ownership while giving adjoining land on the west side over to State Parks. Though not officially inventoried, these lands include reserves, preserves, state parks and state recreation areas. Most restricted use lands are Reserves while least restrictive are Recreation Areas. These lands are low usage. Off Road Vehicle use is prohibited. Some waterfowl hunting is permitted.

Waste Characterization
Sewage Sludge/Septage: 93 Cuyd/mo. average by 1994. Sewage sludge in evaporation ponds until 1992, then de-watered sludge was placed in LF. Septage was placed in separate Evaporation ponds. 3 pond types

- Domestic Septage (EPA tests).
- Municipal biosolids
- Whey from cheese plant.

Dead Animals: Primarily dead livestock Placed in pits and immediately buried. ~75 animals/mo. by 1994.
Asbestos. Accepted at landfill, required to be in double plastic bags.
Seafood Processing Waste: Fish, crab shells and shrimp. Mixed with sawdust and composted. Spread into windrows and composted. Mixed with native soils to use as LF cover. ~102 CY/Mo. (seasonal fluctuations).
White Goods: ~106 pieces /Mo. removed when 300Tons is accumulated. Removed by licensed operator. Chlorofluorocarbons removed before crushing and shipping.
Wood Waste: Clean material is burned twice/yr. ~57 CY of brush/mo.
Tires: stored in separate area and removed ~76 Tires/mo.
Hazardous materials. Screened, not accepted at site.

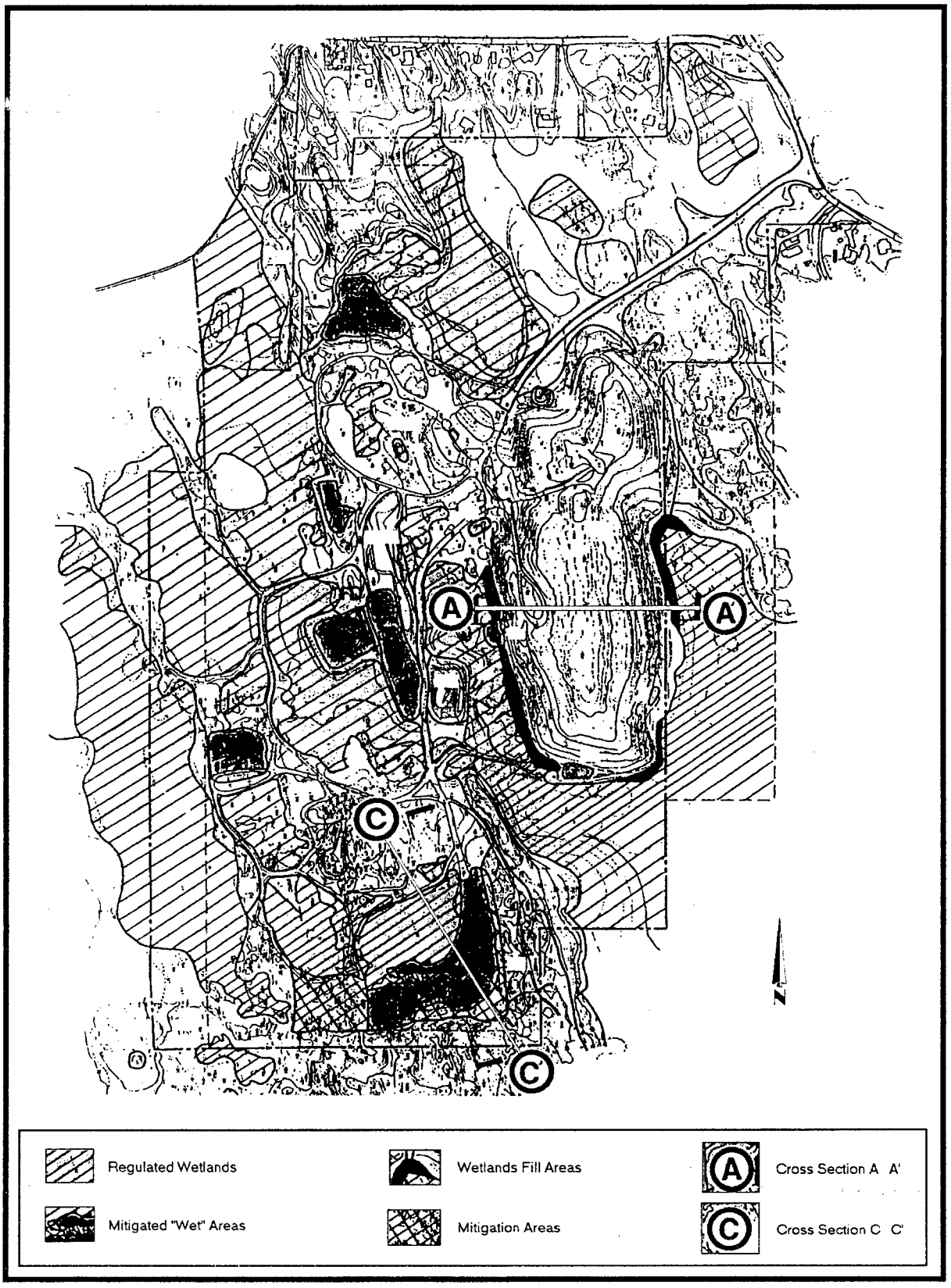
Problem: The operator wishes to continue using part of the site for a transfer station and composting facility for green materials and other compostables. The rest of the site is being closed with no specific post-closure use.



Old Landfills and Sensitive Habitats

Crescent City Landfill Existing Facility

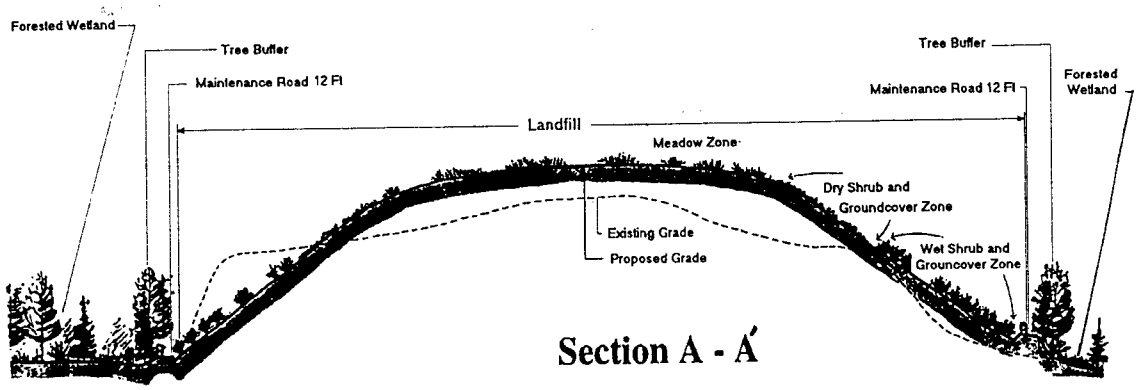
Crescent City Landfill Closure Mitigation Monitoring and Reporting Program 4/96



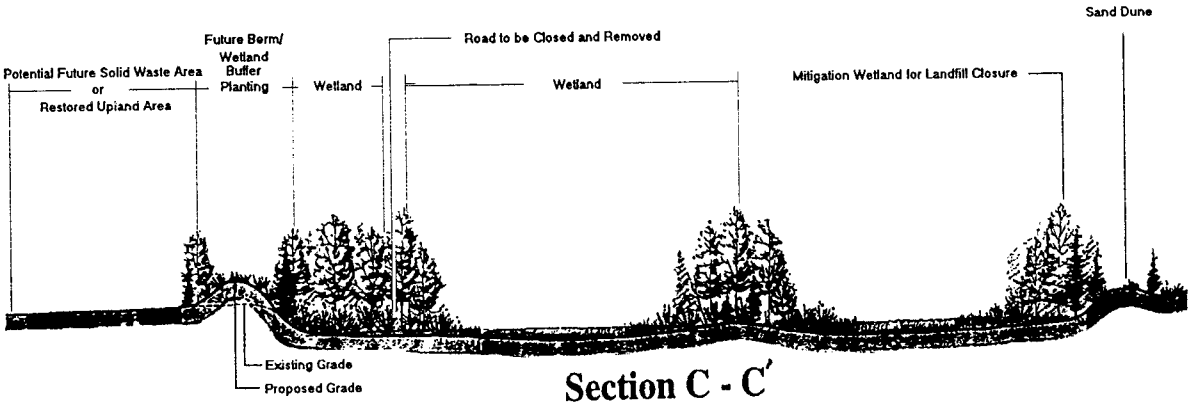
Old Landfills and Sensitive Habitats

Crescent City Landfill and Adjacent Wetlands to Lake Earl

Crescent City Landfill Closure Mitigation Monitoring and Reporting Program 4/96



Section A - A'



Section C - C'

Notes:
In Section C-C existing grade is coincident with base of existing wetland and proposed grade is approximately coincident with proposed water level of the mitigation wetland. These cross-sections are details of those included in the Crescent City Landfill Closure Master Plan. Section B-B from that report is not relevant to this wetlands permit application, and has thus been omitted from this detail drawing.

0' 50' 100' 200'
Horizontal Scale

Crescent City Landfill Closure Mitigation Monitoring and Reporting Program 4/96

U.S. Army Corps of Engineers
Regulatory Jurisdiction

AUTHORITY - Section 404 of the Clean Water Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits, after notice and opportunity for public hearing, for the discharge of dredged or fill material into waters of the United States at specified disposal sites. (33 U.S.C. 1344)

PERMIT APPLICATION EVALUATION - Policies applicable to review of all applications for permits:

a) Public Interest Review
b) Effect on Wetlands
c) Fish and Wildlife
d) Water Quality
e) Historic, Cultural, Scenic and Recreational Values
f) Effects on the Limits of Territorial Seas
g) Consideration of Property Ownership
h) Activities Affecting Coastal Zones
i) Activities in Marine Sanctuaries
j) Other Federal, State or Local Requirements
k) Safety of Impoundment Structures
l) Flood Plain Management
m) Water Supply and Conservation
n) Energy Conservation and Development
o) Navigation
p) Environmental Benefits
q) Economics
r) Mitigation

DEFINITIONS -
Waters of the United States:

1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to ebb and flow of the tide;
2) All interstate waters including interstate wetlands;
3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use degradation or destruction of which could effect interstate or foreign commerce...;
of the United States under the definition;

Wetlands:

4) All impoundments of waters otherwise defined as waters
5) Tributaries of waters identified in items 1-4;
6) The territorial seas;
7) Wetlands adjacent to waters identified in 1-6 .

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Ordinary High Water Mark:

That line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestial vegetation, the presence of litter or debris, or other appropriate means that consider the characteristics of the surrounding area.

TYPES OF PERMITS -

Individual Permit - Requires Public Notice
Requires WQ Certification or Waiver

Nationwide General Permit - Requires WQ Certification or Waiver

Letter of Permission - Minor Work
Requires consultation with resource agencies(EPA, USFWS, NDEP, NDOW, NSL)

Emergency Work - Coordination with Division Engineer
Consultation with resource agencies

INFORMATION SHEET ON THE US ARMY CORPS OF ENGINEERS PERMITTING PROGRAM UNDER SECTION 404 OF THE CLEAN WATER ACT

The intent of this document is not to provide you with all requirements under our permitting program, only the regulations can do that, but rather to provide people in the field with enough information so that they can make decisions about whether or not projects in their areas need to be brought to the attention of the Corps for possible 404 permitting actions.

The Corps of Engineers' jurisdiction in this area is under Section 404 of the Clean Water Act (CWA). Section 404 of the CWA requires that a Department of the Army permit be issued prior to discharging dredged or fill materials into "waters of the United States." 33 CFR Parts 320, 323, 325 through 328, and 330 describes the specific requirements and procedures of the program. In general, a discharge of dredged material includes but is not limited to any addition, including redeposit, of dredged material, including excavated material, into the "waters of the United States" which is incidental to any activity including mechanized landclearing, ditching, channelization, or other excavation.

The definition, in part, of "waters of the United States", as described in 33 CFR Part 328, is: All waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce... including tributaries of these waters. In other words the Corps' jurisdiction is very broad and frequently extends to dry ephemeral channels where water neither currently exists, nor has existed for many months. The only requirement is that a channel be shown to provide water, at some time in the past, to a location where it (the water) may be used for purposes of interstate commerce. Interstate commerce could be construed as anything from cattle, to migratory water fowl, to providing recreation for out of state tourists.

There are some activities which are exempt from permitting requirements, as described in 33 CFR Part 323.4, however most activities impacting waters of the United States do require a permit. There are three categories of permits: Regional General Permits, Nationwide Permits, and Individual Permits.

Regional General Permits: Regional General Permits, as described in 33 CFR Parts 323.2 (h) and 325.2 (e)(2), are issued by a Corps of Engineer District for categories of activities that are similar in nature and cause only minimal impact. An example of a Regional General Permit in Nevada is General Permit number 0006 (GP0006) which authorizes fills associated with the construction of bridges and culverts assuming certain conditions are met. It must be understood however that the Corps retains the authority

in all cases to determine whether or not a particular project will be authorized under a particular Regional General Permit. Therefore anyone conducting activities under which they believe a Regional General Permit is has been issued, must still notify the Corps so that the authority can be verified. This discretionary authority allows the Corps to require that Individual Permit procedures be followed for a particular project even if that project meets all the conditions of a Regional General Permit. As you will see in the next paragraph this discretionary authority holds true for Nationwide Permits as well.

Nationwide Permits: Nationwide Permits, as described in 33 CFR Part 330, is a type of general permit issued by the Chief of Engineers in Washington DC, and are designed to regulate with little, if any, delay or paperwork certain activities having minimal impacts. There are currently 36 Nationwide Permits for various activities described in 33 CFR Part 330. The primary difference between this permit and a Regional General Permit is that Nationwides are issued for the entire nation while Regionals are specific to a particular geographical area of the country. As with Regional General Permits, the Corps retains the authority in all cases to determine whether or not a particular activity will be authorized under a Nationwide Permit. In other words, if someone decides to perform a particular activity which they believe can be conducted under the authority of a Nationwide Permit, they should first notify the Corps to verify that the work is authorized under that Nationwide Permit. If they do not they run the risk of mis-interpreting the regulation or the permit requirements and therefore violating section 404 of the CWA.

Individual Permits: Applying for, and the processing of, Individual Permits is described in 33 CFR Part 325. Individual Permits are normally issued for large projects or projects that will have other than minimal impact on waters of the United States. However, as discussed above, small projects or projects with seemingly minimal impact can also require an Individual Permit. This is particularly true in the case of projects that may have minimal impact but do not fall into any category covered under a Regional General Permit or a Nationwide Permit. Again, at the discretion of the Corps, projects which may be authorized under a Regional or Nationwide Permit may still be required to go through procedures for an Individual Permit. There may be many reasons for the Corps to make such a decision. One of the most common reasons is what is known as "cumulative" impact. Frequently, a single project by itself may have only minimal impacts but taken in conjunction with other "minimally impacting" projects, may have quite a large overall or "cumulative" impact. In cases like this the Corps may require Individual Permit procedures be followed to insure appropriate protection for the environment. Individual Permit actions involve many outside resource agencies, both State and Federal, and may take quite a long time to be completed. Frequently, Environmental Impact Statements (EIS) or Environmental Assessments (EA) may have to be completed, and/or public meetings held, before a

permit can be issued. Individual Permits also cost the applicant money; $10.00 for a private (non-commercial) project, $100.00 for projects with a commercial or industrial nature.

The primary function of the entire 404 permitting process is to protect wetlands. To do this, the Corps looks at every project in view of the following three issues: 1) Avoidance - Has the applicant taken all reasonable steps to avoid wetlands in designing his/her project?; 2) Minimization - Has the applicant taken all reasonable steps to minimize impacts to wetlands that are being impacted by his/her project?; 3) Mitigation - For those wetlands which could not be avoided, has the applicant proposed an adequate plan to mitigate for the loss? If an applicant can prove that he/she has met, in sequence, each of these issues to the satisfaction of the Corps, he/she stands a much better chance of having his/her project permitted.

For every permitting action the Corps must conform to requirements of the National Environmental Policy Act (NEPA) The Corps decision on any permitting action is made after performing a public interest review of all the direct and indirect impacts of the project for which the permit has been requested. Because of this public interest review, many projects are permitted only after special conditions, specific to that particular project, are attached to the permit. These special conditions frequently come about due to our coordination with other government agencies. These special conditions must be adhered to by the applicant or the permit becomes void. One of the most frequent special conditions is the requirement for mitigation for the impacts. Mitigation can be a special condition to any of the three types of permits and may be quite substantial.

This is a brief summary of the Corps' 404 permitting jurisdiction, requirements, and procedures. This is not an all inclusive document. Only the regulations can provide the exact and detailed requirements. The information contained in this document is general in nature and should only be used as guidance on whether or not more research needs to be done on a particular project to determine if a Corps permit may be necessary. Only Corps regulatory personnel may make a definitive decision on whether or not a particular project requires a permit, or what type of permit is required. The bottom line is: If in doubt get a decision from the corps regulatory office. The time and effort taken to contact the Corps for a decision on projects that may indeed result in a "No Permit Required" before doing any work, is much cheaper and less time consuming than finding out you are in violation and have to "Cease and Desist" all activities related to that project.

Laws Regulating the Program

The U.S. Army Corps of Engineers is mandated to regulate certain activities in all waterways and wetlands under the following sections of Federal law:

- 33 CFR - Navigation and Navigable Waters (COE)

- 40 CFR - Protection of Environment (EPA)

- Section 9 of the Rivers and Harbors Act of 1899 requires authorization from the Secretary of the Army, acting through the Corps of Engineers, to construct any dam or dike in a navigable water of the United States. The construction of bridges and causeways requires permits under Section 9, but the authority to issue permits with respect bridges and causeways was transferred to the U.S. Coast Guard in 1966 when the U.S. Department of Transportation was created. However, Department of the Army authorization is required for the discharge of dredged or fill material into waters of the United States associated with dams, dikes, bridges, and causeways under Section 404 of the Clean Water Act.

- Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the Secretary of the Army, acting through the Corps of Engineers, for the construction of any structure in or over any navigable water of the United States. Structures or work outside the limits defined for navigable waters of the United States require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, rechannelization, or any other modification of a navigable water of the United States, and applies to all structures, from the smallest floating dock to the largest commercial undertaking. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g. riprap, revetment, bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent, or semi-permanent obstacle or obstruction.

- Section 404 of the Clean Water Act requires authorization from the Secretary of the Army, acting through the Corps of Engineers, for the discharge of dredged or fill material into all waters of the United States, including wetlands, both adjacent and isolated. Discharges of fill material generally include, without limitation: placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; dams and dikes; artificial islands; property protection or reclamation devices such as riprap, groins, seawalls, breakwaters, and revetments; beach nourishment; levees; fill for intake and outfall pipes and subaqueous utility lines; fill associated with the creation of ponds; and any other work involving the discharge of fill or dredged material. A Corps permit is required whether the work is permanent or temporary. Examples of temporary discharges include dewatering of dredged material prior to final disposal, and temporary fills for access roadways, cofferdams, storage and work areas.

- Section 103 of the Marine Protection Research and Sanctuaries Act of 1972, as amended, requires authorization from the Secretary of the Army, acting through the Corps of Engineers, for the transportation of dredged material for the purpose of dumping it in ocean waters. Discharges of dredged or fill materials into territorial seas also requires authorization under Section 404 of the Clean Water Act.

CHRONOLOGY OF CORPS OF ENGINEERS' SECTION 404 PERMIT PROCESS FOR THE CRESCENT CITY LANDFILL CLOSURE, DEL NORTE COUNTY, CALIFORNIA; 1995 TO PRESENT

For description of project, refer to Corps of Engineers' Public Notice No. 21555N77 dated February 28, 1996

Early March 1995 - The Army Corps of Engineers (COE), Eureka Field Office (under supervision of San Francisco District), was contacted by the Del Norte Solid Waste Management Authority (DNSW) regarding the possible need for Corps permit for the landfill closure activity. Informal pre-application meeting scheduled.

20 March 1995 - COE, DNSW, California Dept. of Fish and Game, Del Norte Co. Public Works, Del Norte Co. Health Dept (local enforcement agent for California Integrated Waste Management Board), Redwood Community Action Agency (local consultant) met to discuss permit requirements associated with landfill closure in wetlands. Purpose of this meeting was to outline the COE permit process, understand the scope of the landfill closure work and agencies to work with. Before COE can make a decision whether a permit is required or not, the COE must conduct a jurisdictional determination ; i.e. What areas of the landfill are in Corps jurisdiction such as wetland, other waters of the United States (streams, lakes, ponds). COE recommended that a wetland delineation be performed at the landfill site.

22 March 1995 - COE contacts DNSW after the meeting, and describes a possible mechanism to speed permit processing by use of Nationwide Permit No. 38, (Cleanup of Hazardous and Toxic Waste). This nationwide permit allows hazardous waste clean-up activities to occur in Corps jurisdiction such as wetlands if the applicant is ordered or mandated by a state or local agency (or by court order) to clean up a site (including containment, stabilization or removal of hazardous or toxic waste materials). This nationwide permit requires applicant to submit a Pre-Construction Notification to the COE, which in turn would circulate the Notification for Federal, state and local comment under a 15 day comment period. DNSW stated no known hazardous or toxic waste has been placed at Crescent City landfill (DNSW does not allow hazardous waste or toxic disposal there). COE decided on this information that Nationwide Permit 38 would not be appropriate and that an individual Section 404 permit would be processed..

July 1995 - DNSW submits preliminary wetland delineation report to COE via Michael P. Williams consulting firm of Seattle

17 July 1995 - Joint site visit at the landfill with COE, DNSW and consultant to confirm wetland delineation. COE confirmed that approximately one acre of wetlands would be impacted and made recommendations for changes to wetland delineation map.

3 August 1995 - DNSW notifies COE and other Federal/State/local agencies of late Sep 1995 meeting to discuss recently released Crescent City Landfill Master Plan

11 Sep 1995 - DNSW submits revised wetland delineation report to COE based on July joint site visit and Corps recommendations

28 Sep 1995 - COE attends workshop setup by DNSW to present and discuss elements of the Crescent City Landfill Closure Master Plan. The intent of the Master Plan is to develop a comprehensive land use plan for the landfill closure and related uses for the entire 167 acre site.

21 Nov 1995 - COE provides written comments on the above Master Plan

27 Dec 1995 - DNSW submits Section 404 Department of the Army permit application to COE for placement of landfill cap on one acre of wetlands including Preliminary Wetland Mitigation Plan prepared by Michael P. Williams

5 Feb 1996 - DNSW submits Cultural Resources Survey of Portions of the Crescent City Landfill Property as requested by COE pursuant to Section 106 of the National Historic Preservation Act coordination. No significant prehistoric or historic cultural resources were found at the site but conditions were recommended that if any artifacts or cultural features are found, construction work shall halt until an archaeologist is brought on site to investigate.

28 Feb 1996 - DNSW permit application is considered complete by COE and COE circulates Public Notice and Preliminary Environmental Assessment pursuant to National Environmental Policy Act (NEPA). 30 day comment period

During Public Notice comment period, received comments from U.S. Fish and Wildlife Service, California Coastal Commission, California Regional Water Quality Control Board, California Department of Fish and Game, and one private individual. The only adverse comments was from the private individual who recommended landfill seek other alternatives to landfill capping including remediation in place, incineration, etc. Both the U.S. Fish and Wildlife Service and California Department of Fish and Game commented mostly on the wetland mitigation plan and made recommendations for changes and additions to the mitigation plan. California Regional Water Quality Control Board states the proposed project meets the waste discharge requirements for landfill closure and states the waste discharge requirements are equivalent to Section 401 Water Quality Certification necessary prior to issuance of a Corps permit. Coastal Commission concerns were resolved during the Local Coastal Plan process delegated to Del Norte County pursuant to Federal Coastal Zone Management Act (CZM).

April 1996 - Corps forwards above comments to DNSW

16 May 1996 - DNSW responds to Public Notice comments and agrees to most of recommended changes for wetland mitigation plan.

6 June 1996 - DNSW submits revised Wetland Mitigation Plan, this time prepared by Winzler and Kelly consulting engineers

14 June 1996 - COE re-circulates revised mitigation plan to key agencies for comment. All

agencies support mitigation plan, but Calif. Dept of Fish and Game requests adding monitoring of bird/wildlife use of mitigation site

11 Jul 1996 - COE completes Final Environmental Assessment and issues first transmittal of COE permit with special conditions to applicant. Applicant must sign and notarize permit to validate.

15 Jul 1996 - After applicant submits signed/notarized permits, documents including decision document and EA are sent to Regulatory Branch Chief for signature. Final transmittal of permit issued to DNSW. Special conditions of permit include requirement for submittal of mitigation monitoring reports to COE and notification to COE of project completion. Landfill closure activity began the day of issuance.

18 Oct 1996 - COE conducts compliance inspection of landfill closure project. At this point, landfill closure is 80% complete. Due to contracting/funding delays, wetland mitigation work is not complete, although some material has been excavated from the migitation site, final grading not expected late fall or early 1997. Dredged material from the Crescent City Harbor District was part of the landfill cap but could not be used for revegetation due to high salt content

17 Dec 1996 - DNSW reports to COE heavy rains have caused run-off problems at the landfill and delayed closure activity. Despite hydro-seeding shortly before heavy rains, landfill cap material ran off into wetlands below, exceeding the authorized placement of fill into one acre of wetlands. DNSW constructed two additional sediment basins to collect future run-off

19 Dec 1996 - DNSW reports to COE that in order for DNSW to be eligible for Federal Emergency Management Agency reimbursement for storm damages (and to remove run-off silt from wetlands), needs COE document stating whether permit revision required or not

16 Jul 1997 - In response to FEMA letter of 9 May 1997, COE states a study would be required to distinguish project construction fill in wetland versus wetland fill due to non-point run-off source. COE does not requlate fill in wetland due to non-point source run-off or liquid discharge.

15 August 1997 - DNSW evaluates area of wetland impacted by both project construction and non-point run-off. Area of wetland filled by construction impacts was calculated to be less than one acre permitted; non-point source run-off was additional impact that COE would not require to be mitigated for. DNSW also reported completion of Phase I closure

14 Oct 1997 - Landscaping Implementation Plan, Final Planting Plan, Mitigation Wetlands at Crescent City Landfill submitted by DNSW to COE via private contractor

23 Oct 1997 - COE conducts compliance inspection of landfill site and wetland mitigation site. Grading work for mitigation site nearly complete; surveying work underway for planting of wetland and riparian buffer vegetation; and water well monitoring in progress

20 January 1998 - Winzler & Kelly letter to COE reports result of Wetlands/Construction Boundary analysis and mentions California Regional Water Quality Control Board has lifted Cease and Desist Order on the Crescent City landfill.

11 Mar 1998 - DNSW letter to COE reports grading of wetland mitigation and buffer areas is complete and completed first set of plantings in the wetlands and buffer areas. DNSW relays from Winzler and Kelly advice that after plantings are completed, baseline data (GIS for landfill site being developed by DNSW) must be provided regarding the landfill. DNSW requests delay in submitting first annual report until November 1998. COE grants the delay.

Upon receipt of the November report, COE will conduct another compliance inspection of the landfill closure site and wetland mitigation area (weather permitting). All North Coast stations received above normal rainfall the winter of 1997-1998, with Eureka getting 58 inches and outlying areas 75 inches or more

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
333 MARKET STREET
SAN FRANCISCO, CALIFORNIA 94105-2197

REPLY TO
ATTENTION OF:

Regulatory Branch (1145b)

SUBJECT: File Number 21555N

Mr. Kevin Hendrick, Director
Del Norte Solid Waste Management Authority
391 Front Street
Crescent City, California 95531

Dear Mr. Hendrick:

Enclosed is your signed copy of a Department of the Army permit (Encl 1) to place approximately 4,100 cubic yards of fill as a landfill cap onto one acre of wetlands, construct a perimeter access road, and remove an existing temporary access road from wetlands in connection with the proposed landfill closure at the Crescent City Landfill, located adjacent to Lake Earl and Cadra Slough, off of Hights Access Road, near the city of Crescent City, in Del Norte County, California.

Please complete the appropriate parts of "Notice to Permittee" form (Encl 2), and return it to this office. You are responsible for ensuring that the contractor or workers executing the activity authorized herein is knowledgeable with the terms and conditions of this authorization, and that the "Notice of Authorization," ENG Form 4336 (Encl 3), is posted in a conspicuous place at the site prior to the start of work.

Sincerely,

ORIGINAL SIGNED
By
Calvin C. Fong
For
Richard G. Thompson
Lieutenant Colonel, Corps of Engineers
District Engineer

Enclosures

Exercise 2 Coyote Canyon Landfill (Overview)

History of Site and Environs

The site originally opened as a waste disposal facility in 1963, encompassing 300 acres owned by the Irvine Co. and leased to Orange Co. Wastes come from residential, commercial, institutional, recreational and agricultural sources.
The Coyote Canyon landfill was closed to disposal of waste March 1990.
Approximately 60 million cubic yards of waste were disposed of at the landfill during its active life.
A new site at Bee Canyon LF was opened March 5, 1990.

Physical Features of Site

The landfill site is located at the northwestern edge of the San Joaquin Hills, in Orange County. The landfill occupies what was originally two main canyons trending (descending) south to north and two side canyons (East and South Canyons) which run from east to west. Coyote Canyon, in turn, joins with Bonita Canyon, which continues north to San Diego Creek and Upper Newport Bay. A roadway excavation, for Newport Coast Drive (formerly Pelican Hill Road) separates the East and South Canyon fills from the main canyon. This road was constructed in 1990. Native soils were scraped from the canyon walls to be used as cover soil for the landfill. Waste was placed in the site in layers ~20 feet thick, attaining final elevations. Approximately 200 vertical feet of waste is placed in the main canyon.

The final grading contours of the landfill were developed so that the completed landfill would blend with the adjacent rolling hills. The main canyon was constructed with an elongated ridge running from south to north through the center of the site. The landfill is sloped east and west from this ridge at slopes from 3% to as high as 15%. The northernmost slope of the landfill is graded at a 2.5 (H):1(V) angle with benches 15 ft. wide located at 40 vertical foot spacings. The East and South Canyons have been constructed with crowned decks and descending slopes on all sides. The final grading configurations for the site were constructed to generally follow the same grades as proposed in the original Closure Plan for the site. The most significant change that occurred during closure construction (between 1992 and 1994) was the creation of a habitat area for the California Gnatcatcher bird species. This habitat area was not part of the original closure plan for the landfill. To assure the regulatory agencies that the Gnatcatcher habitat would not interfere with the integrity of the clay barrier layer of the final cover, nine sophisticated moisture monitoring probes were installed within the habitat area to continuously monitor the integrity of the clay layer. Results of the moisture- monitoring program have shown no detrimental impacts to the clay layer. Final closure certification for the landfill was issued by the regulatory agencies March 1995.

Designated Coastal Sage Scrub habitat covers 104 Ac. of the landfill. This includes 90 Ac. on the Main Canyon, 9 Ac. on the East Canyon and 5 Ac. on the South Canyon. A 6-foot thick final vegetative cover was added to the final grade vegetative layer to provide adequate rooting depth for the native vegetation.
The vegetative layer overlays a 1 ½ foot thick clay layer.
The remaining landfill vegetative layer is 3 ½ feet thick.
Topsoils consist of residual sands, silts and clays. These soils are generally loose, porous and unconsolidated. Clayey soils may be slightly to moderately expansive.
Average annual precipitation at the landfill is about 14 inches and annual evaporation rate is 55 inches.
Groundwater elevation is approximately 40 to 50 feet below the ground surface and is flowing from south to north.

Goal of the Habitat Program

The goal of the habitat program at the landfill is to provide self-sustaining coastal sage scrub habitat that will achieve similar patterns of cover and species distribution as an existing scrub community. Ultimate performance standards were established for the site such that a minimum cover of 70% of sage scrub species is required. A seed palette was developed, based upon coastal sage scrub species found in the San Joaquin Hills. However, because the integrity of the landfill's clay layer had to be maintained, deep-rooted woody species such as laurel sumac (*Malosma laurina*) were not included in the seed mix. Seeds were planted from October 1993 through May 1994 as landfill closure progressed and mitigation areas were available for planting. The Main Canyon was seeded first, in the fall-winter months, followed by the South Canyon, and finally the East Canyon, which was seeded late in the spring. Seeding was accomplished by drilling in areas of relatively flat terrain and hydroseeding on steeper slopes. Daily overhead irrigation was used from the time of seeding through the summer until October 1994, except for the use of pre-irrigation for re-seeded areas. Extensive re-seeding was required in the 1995/1996 season for the East and South Canyons and a small area of the Main Canyon. A horticultural maintenance and monitoring program for the habitat areas is being implemented for the site. The program includes the vigorous weeding program against sweet clover *(Melilotus indica*) and burr clover (*Medicago polymorpha*) on the Main Canyon. Maintenance also includes weeding the established areas for mustard (*Brassica nigra*), tree tobacco (*Nicotiana gluaca*), artichoke thistle (*Cynara cardunculus*) and *acacia (Acacia spp*) throughout the spring seasons.

The Performance Monitoring Report for the coastal sage shrub habitat at the landfill submitted to the USFWS, date May 1997, states the following;

- The habitat areas continue to show a trend toward establishment of coastal sage scrub species 3 ½ years after seeding of the site. Seedlings of native sage scrub species recorded in 1997 doubled over the frequency recorded in 1996. The

increase in seedlings this year indicates that the site is trending toward sustainability

- Full maturation of the habitat areas will take several years. Changes over time of the cover shrub versus herbaceous species and of native versus nonnative species will provide an indication of habitat development as can be observed in changes from the 1996 to 1997 season.
- The avian (bird) wildlife that utilize grassland and shrub habitats observed at the site during 1997 indicates the site is continuing to develop as a coastal sage scrub community. Generally, gnatcatchers are found nesting in habitat that has an average height over .5 meter. The average height of the shrubs on the Coyote Canyon Landfill is .36 meter. It is concluded that the gnatcatchers are not expected to nest onsite until the California sagebrush and California buckwheat continue to grow and establish on the landfill. Currently, several pairs of the gnatcatcher are nesting in coastal sage scrub adjacent to the landfill, and the birds have been seen on the edge of the coastal sage scrub on the east slopes of the mitigation area.

Performance monitoring of the site will continue until the site requires no significant maintenance and the site achieves at least 70% cover of coastal sage scrub species or is occupied by breeding pairs of California gnatcatchers.

Biota

Several habitats are found near the site. These, based on plant communities, include:

- Grasslands, Originally native perennial grasses, forbs and wildflowers, some annuals. Displaced by grazing and introduced species. Some native perennial bunch grasses still present.
- Coastal sage scrub dominated by ~ 4" tall summer dormant and drought deciduous shrubs, cactus, open grassy, mixed scrub and arroyo communities.
- Chaparral in the unaltered areas of dense, hard-leafed evergreen shrubs.
- Oak woodlands in canyon floors and lower slopes. Isolated to woodland groups.
- Coast Live oak dominates woodlands. Sycamores may be found along stream channels.
- Rushes and grasses can be found at seeps.
- Ruderal habitats on bordering trails, cut and fill and other disturbed areas. European weeds dominate these frequently disturbed areas, including roads, and fuel breaks.

Smaller mammals, including mice, gophers and squirrels dominate grassland animal species. Larger animals include deer, coyote, badger, bobcat, raccoon, opossum and rabbits. Reptiles include lizards and snakes. Birds include lark, sparrows, shrikes and kestrels, ravens and crows. All local raptor species occupy this area.

Sage scrub animal species include the western whiptail and diamondback rattlesnakes, wren, quail and shrike, rabbits, mice, rats and coyotes. Chaparral is occupied by the same species as are found in sage scrub communities.
Oak woodland provides good habitat for amphibians including salamanders. Reptiles include lizards and snakes. Small mammals include mice, rats, shrew and gopher while opossum, raccoon, skunk, deer, coyote and bobcat fill the larger species places. Birds include sparrow, warbler, hawks, kites and owls.
Riparian communities possess high animal diversity. Amphibians are represented by frogs, toads, and salamanders. Lizards, skinks and snakes make up the reptile community. Rodents are common as well as squirrels, opossum and rabbits. Predators include spotted and striped skunk, coyote and bobcat. Deer also occupy the riparian zones. Birds are plentiful with predatory species of hawks, kites and owls.

Bird species on National Audubon Society Blue List of Declining in population nationwide or of local concern

Grassland	Woodland	Coastal Sage
Loggerhead Shrike	Red Shouldered Hawk	Black tailed Gnatcatcher
Grasshopper Sparrow	Ruby Crowned Kinglet	California Gnatcatcher*
Western bluebird	Cooper's Hawk	
Marsh Hawk	Barn Owl	
	Bewick's Wren	
	Red-shafted Flicker	

*The California Gnatcatcher is listed as **Threatened** by US Fish and Wildlife Service (USFWS).

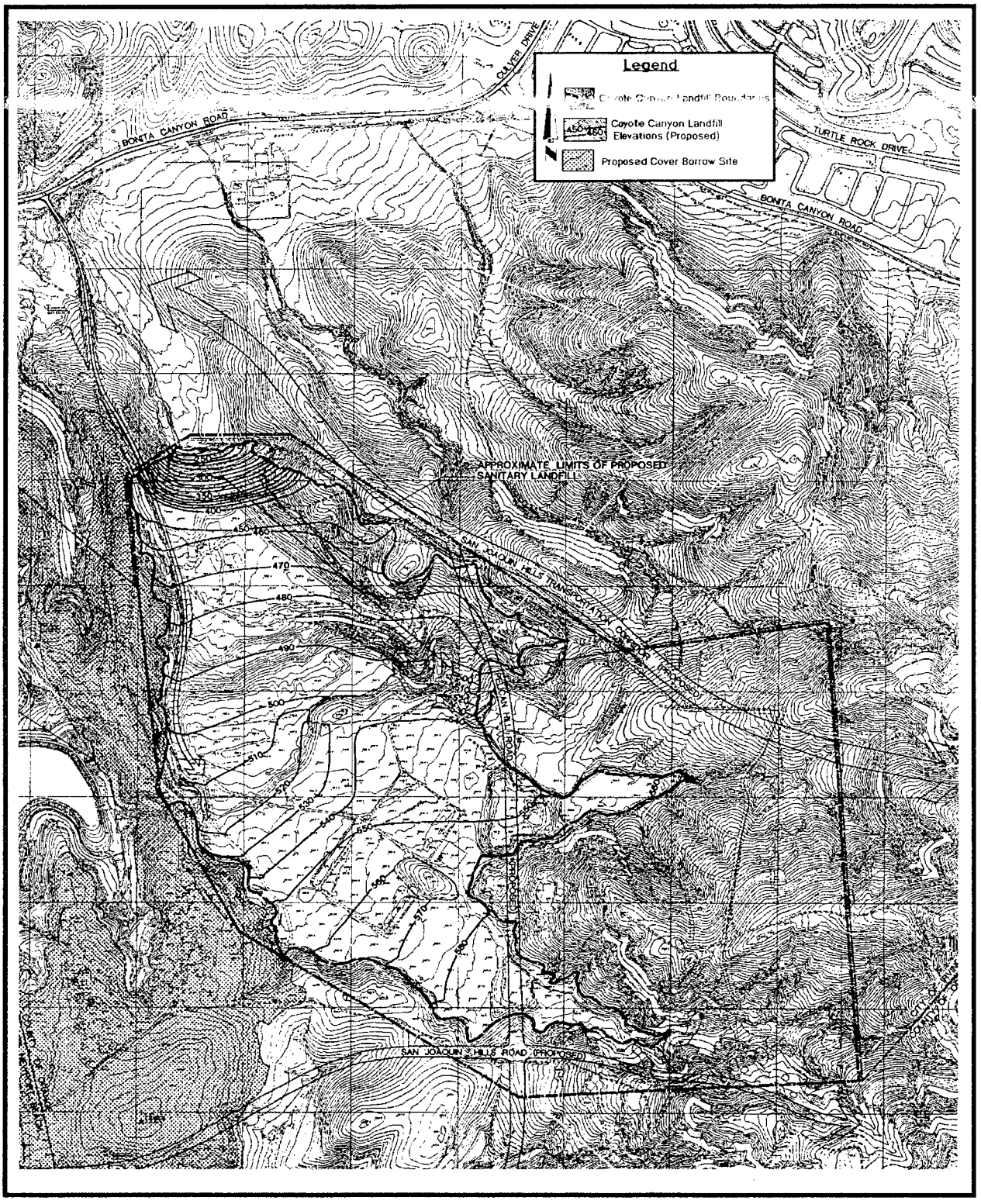
Waste Types

Coyote Canyon is a Class II-2 sanitary landfill. This class has vertical and lateral hydraulic continuity with useable groundwater but soil types, depth to groundwater, artificial barriers or other factors assure protection of groundwater quality. Group 2 and 3 waste are disposed at Coyote Canyon.

- Group 2 decomposable materials, garbage and rubbish from urban activities, non-chemical agricultural/landscaping waste, non-hazardous wastewater treatment plant sludge.
- Group 3 non-decomposable inert materials such as construction, demolition and fill materials.
- Liquids and hazardous materials such as industrial brines, discarded chemicals and other highly toxic substances are specifically prohibited from disposal at Coyote Canyon (group 1 wastes). Solid waste is disposed as lifts in accordance with State Minimum Standards for Sanitary Landfill Operations.
- Soil or daily intermediate cover is obtained from borrow sites using native soils within landfill site boundaries.
- Landfill gas is currently being collected by an existing landfill gas collection and control system. The collected gas is being used to produce electricity at a generation plant located near the east side of the landfill. The current collection system consists of approximately 300 vertical extraction wells

installed around the landfill with an average spacing of about one well per acre.

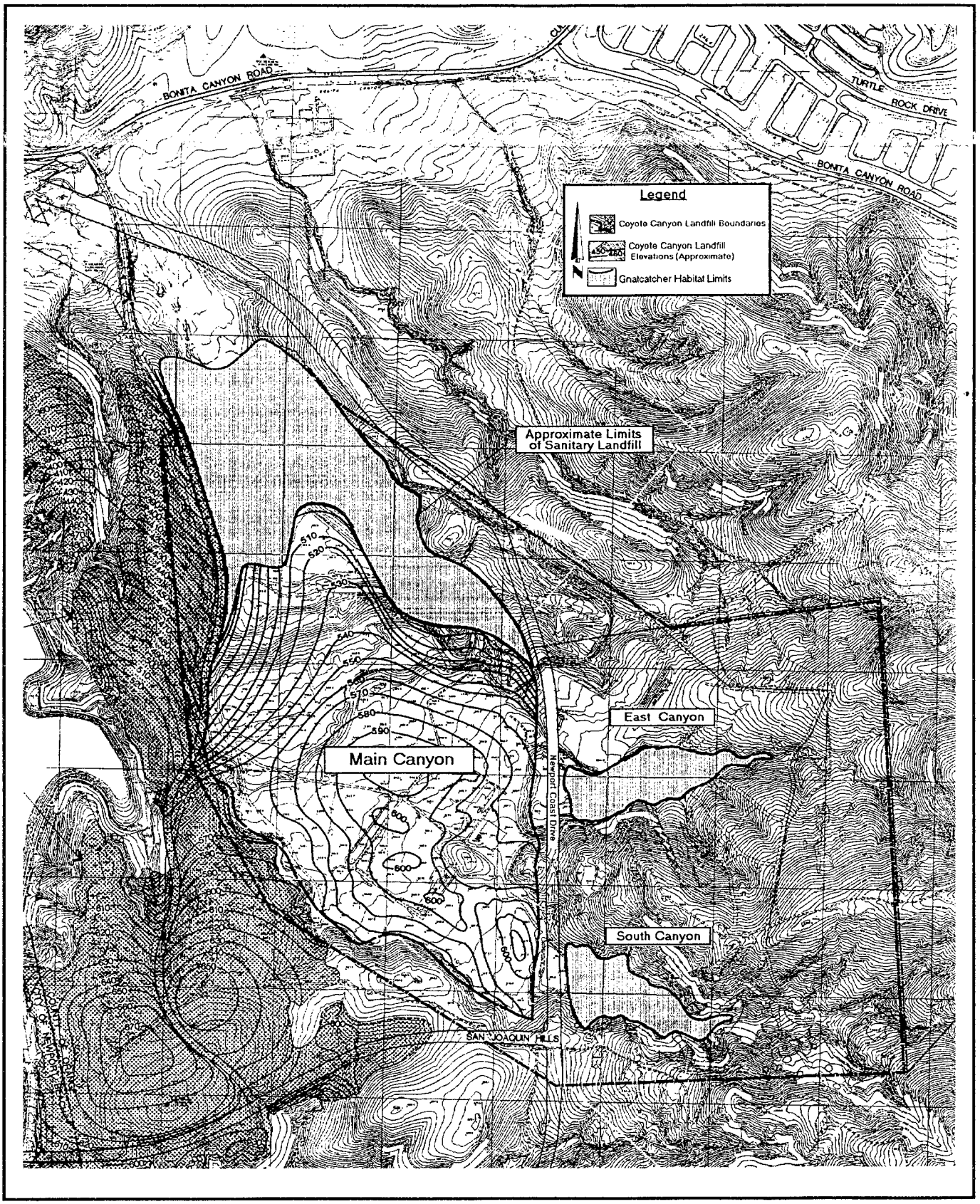
Problem: Site Post Closure use is a planned 18-hole golf course and recreational park. . Propose a plan to integrate a golf course and accommodate habitat requirements for local species. Consideration must be made for sensitive species and necessity for habitat for them. Address local and State/Federal regulatory concerns regarding species.



Old Landfills and Sensitive Habitats

Coyote Canyon Landfill Landfill Boundaries (Alternative1model)

From County of Orange EIR # 507



Old Landfills and Sensitive Habitats

Coyote Canyon Landfill Gnatcatcher Habitat

Exercise 3: South Miramar Landfill (Overview)

History of Site and Environs

Operations at this part of the landfill stopped around 1972.

Physical Features of Site

The site is located along a portion of the south side of State Route 52 and east of the I-805 freeway. The site area encompasses approximately 22 acres of land.

Biota

The landfill site holds six principal vegetation communities. These are chamise, chaparral, and wetland, including disturbed wetland, freshwater marsh, vernal pools and ruderal (disturbed) vegetation.

Ruderal: This community occupies the central portion of the landfill with sparsely distributed weeds, shrubs and herbs. This community takes up about 15.3 acres or ~69.5% of the landfill area.
Chamise: Approximately 25% of the site along an easterly-sloping area consists of relatively undisturbed chamise chaparral, dominated be the plant *Adenostoma fasciculatum.* Scrub oak *(Quercus dumosa,* laurel, sumac *(Rhus laurina*) felt leafed yerba santa, black sage *(Salvia mellifera)* and flat topped golden yarrow *(Eriophyllum confertiflorum).* Mature chamise is densely interwoven. Fires stimulate re-growth by stump sprouting.
Chaparral: about 2.4 Ac (11%) of the site is occupied by undisturbed chaparral. Disturbed chaparral of about 3.6 acres (~16% of the site) is found on the western slopes of the site.
Wetlands: This includes riparian woodland, disturbed wetland and freshwater marsh makes up about .75 acre of the site and is restricted to two channels.
Vernal pools: these are found on the top deck of the landfill and make up about .1acre total basin area (.5% total vegetation). A total of 13 ephemeral vernal pools are located on the top decks. Common vernal pool species inhabit these environments. Three pools are about 5 by 5 meters in size. Three others are around 3 by2 meters in size.
A man-made intermittent drainage channel passes from an adjacent industrial park into, and through the landfill site.
Significant riparian habitat occupies this drainage including native arroyo willow (*Salix lasiolepis*) and Fremont cottonwoods (*Populus fremontii*).

Coyote Canyon Landfill

Background

The Coyote Canyon Landfill is a 300-acre site located at the northwestern edge of the San Joaquin Hills near Newport Beach, California. The site opened for non-hazardous solid waste disposal in 1963 and permanently closed in 1990. There were some 60 million cubic yards of refuse disposed of at the landfill during its active years.

Physical Features and Environmental Setting

The landfill is divided into the Main, East, and South Canyons. The East and South Canyon fill areas are separated from the main landfill by the Newport Coast Drive (formerly the Pelican Hill Road) which was constructed in 1990.

The landfill was developed so that the final contours of the completed landfill would blend with the adjacent rolling hills. The Main Canyon has been constructed with an elongated ridge running from south to north through the center of the site. The landfill slopes east and west from this ridge at grades varying from 3 percent to as high as 15 percent. The north and northeast faces of the Main Canyon portion of the site are sloped at an approximately 2.5 to 1 (2.5:1) gradient with 15-foot wide benches located at vertical spacings of 40 feet. The East and South Canyons have been constructed with a crowned deck areas and descending slopes on all sides.

The final grading configuration for the site was constructed to generally follow the same grades as proposed in the original Closure Plan for the site. The most significant changes that occurred at the landfill during closure construction (between 1992 and 1994) was the creation of a habitat area for the California Gnatcatcher bird species (listed as threatened by the U.S. Fish and Wildlife Service - USFWS). The habitat area was not part of the original final closure plan for the landfill. The habitat was developed as mitigation for the coastal sage scrub habitat that was impacted by the construction of the San Joaquin Hills Transportation Corridor (SJHTC) located just the east of the landfill. To assure the regulatory agencies that the clay layer of the final cover would not be impacted by the installation of the habitat areas on the landfill, nine sophisticated moisture monitoring probes were installed within the gnatcatcher habitat areas to continuously monitor the integrity of the clay layer. Results from the moisture probe monitoring program for the last 3 years has shown no detrimental impacts to the clay layer. Final closure certification was issued by the regulatory agencies for the landfill in March 1995.

The designated coastal sage scrub habitat area covers 104 acres of the landfill (see Figure 1). The habitat areas include 90 acres on the Main Canyon, 9 acres on the East Canyon, and 5 acres on the South Canyon. To provide adequate rooting depths for the plant species proposed for the habitat areas, additional vegetative soil cover was added to the original final grading vegetative layer to create a 6-foot thick vegetative layer on top of the minimum 1 ½ -foot thick clay layer (low permeability layer of 1x10 cm/sec). The remaining areas of the landfill have a 3 ½ -foot thick vegetative layer.

The goal of the habitat program at the landfill is to provide self-sustaining coastal sage scrub habitat that will achieve similar patterns of cover and species distribution as an existing scrub community. Ultimate performance standards were established for the site such that a minimum cover of 70% of sage scrub species is required. A seed palette (see Table 1) was developed based on coastal sage scrub species found in the San Joaquin Hills. However, because the integrity of the landfill's clay layer must be maintained, deep-rooted woody species such as laurel sumac (*Malosma laurina*) were not included in the seed mix. Seeds were planted from October 1993 through May 1994, as landfill closure progressed and mitigation areas were available for planting. The Main Canyon was seeded first, in the fall-winter months, followed by the South Canyon and finally the East Canyon, which was seeded late in the spring. Seeding was accomplished by drilling in areas of relatively flat terrain and hydroseeding on steeper slopes. Daily overhead irrigation was used from the time of seeding through the summer until October 1994. The site has not been irrigated since October 1994 except for the use of pre-irrigation for re-seeded areas. Extensive re-seeding was required in the 1995/96 season for the East and South Canyons and a small area of the Main Canyon. A horticultural maintenance monitoring program for the habitat areas is being implemented for the site. The program includes a vigorous weeding program for sweet clover (*Melilotus indica*) and bur clover (*Medicago polymorpha*) on the Main Canyon. Maintenance also includes weeding the established areas for mustard (Brassica nigra), tree tobacco (*Nicotiana gluaca*), artichoke thistle (*Cynara cardunculus*), and acacia (*Acacia spp*) throughout spring seasons.

The Performance Monitoring Report for the coastal sage scrub habitat at the landfill submitted to the USFWS, dated May 1997, states the following: 1) the habitat areas continue to show a trend toward establishment of coastal sage scrub species 3 ½ years after seeding of the site. The frequency of seedlings of native shrub species recorded in 1997 doubled over the frequency recorded for 1996. The increase in seedling production this year indicates that the site is trending toward sustainability, 2) full maturation of the habitat areas will take several more years. Changes over time in the cover shrub versus herbaceous species and of native versus nonnative species will provide an indication of habitat development, as can be observed in changes from the 1996 to 1997 season, and 3) The avian wildlife that utilize grassland and shrub habitats observed on the site during 1997 indicates the site is continuing to develop as a coastal sage scrub community. Generally, gnatcatchers are found nesting in habitat that has an average height over 0.5 m. The average height of the shrubs of the Coyote Canyon Landfill is 0.36 m. Therefore, gnatcatchers are not expected to nest onsite until the California sagebrush and California buckwheat continue to grow and establish at the landfill. Currently, several pairs of gnatcatchers are nesting in coastal sage scrub adjacent to the landfill, and the birds have been observed on the edge of the coastal sage scrub on the east slopes of the mitigation area. Performance monitoring for the site will continue until the site requires no significant maintenance and the site achieves at least 70 per cent cover of coastal sage scrub species or is occupied by breeding pairs of California gnatcatchers.

Landfill gas at the landfill is currently being collected by an existing landfill gas collection and control system. The collected gas is being used to produce electricity at a generation plant located near the east side of the landfill. The current collection system consists of some 300

vertical extraction wells installed around the landfill with an average spacing of about one well per acre.

Average annual precipitation for the landfill is about 14 inches and the annual evaporation rate is 55 inches.

Groundwater elevation is approximately 40 to 50 feet below the ground surface and is flowing from south to north.

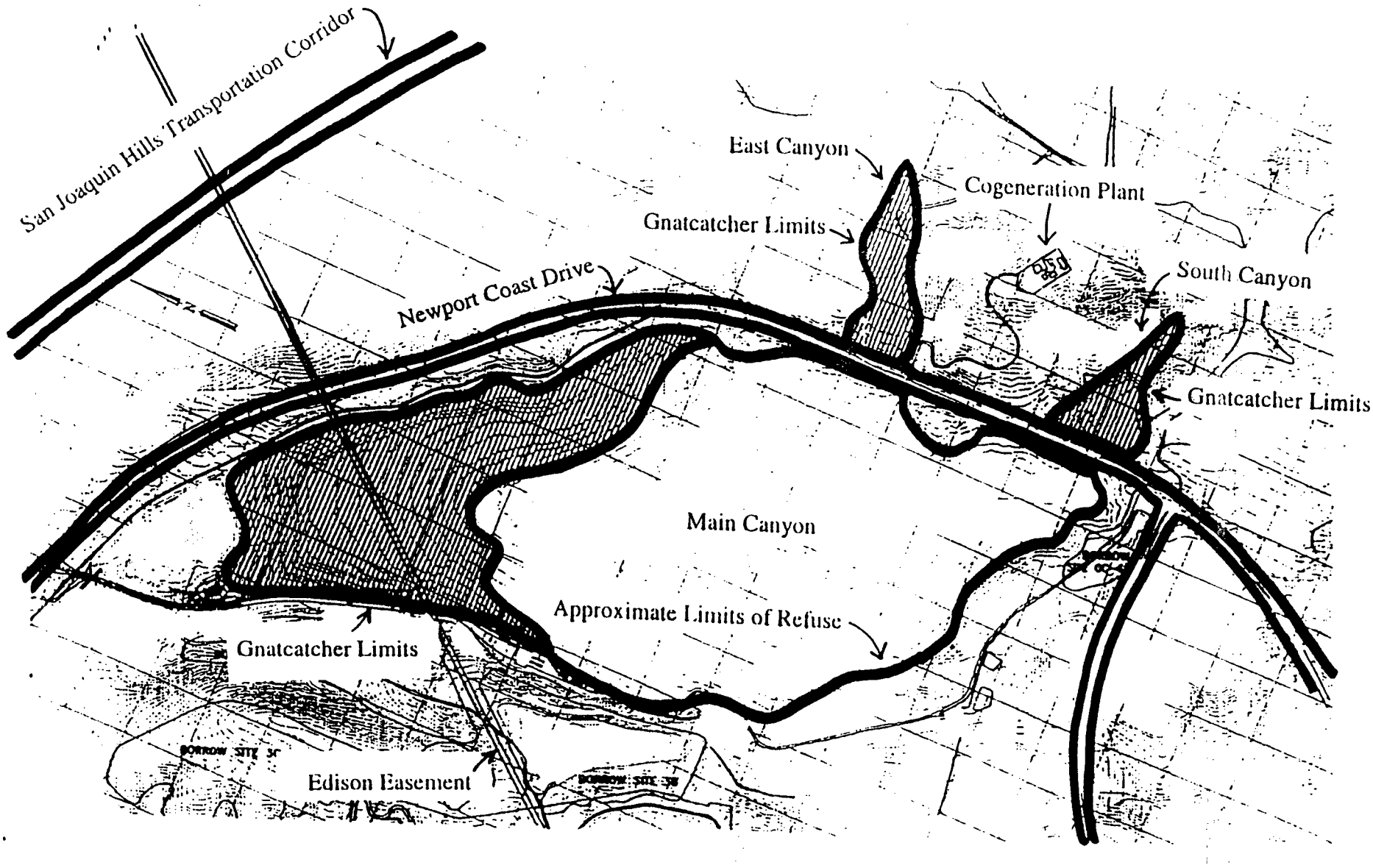


Figure 1

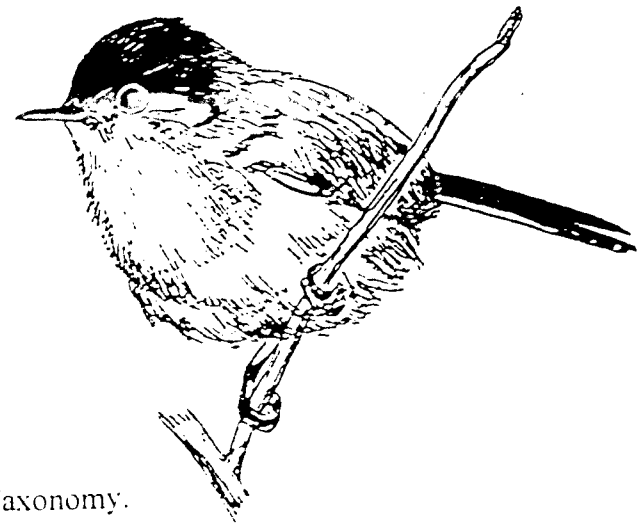
COYOTE CANYON LANDFILL

Table 1

COYOTE CANYON COASTAL SAGE SCRUB SEED PALETTE

Scientific Name	Common Name	Pound of Seed Per Acre	Seed Source
Original Seed Mix Recommendations (November 18, 1993)			
Artemisia californica	California sagebrush	3.0	San Diego County
Bromus carinatus	California brome	3.0	Commercial
Encelia californica	California encelia	2.25	San Diego County
Ericameria pinifolia	pine-bush	0.75	San Diego County
Eriogonum fasciculatum	California buckwheat	8.0	San Diego County
Eriophyllum confertiflorum	golden-yarrow	0.75	San Diego County
Eschscholzia californica	California poppy	1.5	Commercial
Gnaphalium californica	everlasting	0.75	San Diego County
Hordeum brachyantherum ssp. *californicum*	California barley	2.0	Commercial
Isocoma veneta	goldenbush	1.0	San Diego County
Lasthenia californica	goldfields	2.0	Commercial
Lotus scoparius	deerweed	1.5	San Diego County
Lupinus bicolor	miniature lupine	3.0	Santa Barbara County
Melica imperfecta	melic grass	2.0	Commercial
Mimulus aurantiacus (formerly *M. puniceus*)	monkeyflower	0.75	San Diego County
Nassella pulchra	purple needlegrass	4.0	San Diego County
Sisyrinchium bellum	blue-eyed grass	0.5	San Diego County
Total Pounds per Acre		33.75	

CALIFORNIA GNATCATCHER



I. California Gnatcatcher Taxonomy.

In 1926 the California gnatcatcher, which in 1881 had been identified as its own species, was lumped in with the black-tailed gnatcatcher. Some ornithologists were not happy with this taxonomic approach and thought the California gnatcatcher might be distinct from the more broadly distributed black-tailed gnatcatcher, *Polioptila melanura*. When Jonathan Atwood began doing taxonomic studies on the bird in the 1980's, the black-tailed gnatcatcher was a candidate for listing, but despite the loss of significant parts of the northwestern portion of its range, other portions of the population weren't really threatened and the species it wasn't making progress in the listing process.

Based primarily on Atwood's work, in July 1989 the name *Polioptila melanura* was changed to *Polioptila californica*. Initially he suggested two subspecies, *californica* and *margaritae*. A relatively sharp transition of certain traits occurred at 25°N latitude, splitting the species into *californica* in the north and *margaritae* in the southern portion of the range in the Cape region of Baja California, Mexico. Subsequent analysis of the data suggested a third subspecies in the southern area (*abbreviata*), from 24° south, and *margaritae* from 24° to 30°, and *californica* north of 30°. Subspecies definitions were further complicated when a separate set of researchers, analyzing plumage coloration, further split *californica* into *californica* north of the US-Mexican border, and a new subspecies, *atwoodi*, from the border south to about 30°. They also split *margaritae* into *pontilis* from 30° to 28° and *margaritae* from 28° to 26° (Mellink, E. and A. M. Rea).

On May 24, 1990 I attended a lecture on the California gnatcatcher, given by the Association of Environmental Professionals in San Diego. According to my meeting notes, the California gnatcatcher, formerly the black-tailed gnatcatcher, had been divided into 3 subspecies:

- California gnatcatcher, found primarily in Orange and San Diego counties and Baja
- Black-tailed gnatcatcher, found primarily east of the coastal area, in the desert
- Black-capped gnatcatcher, found primarily on the Gulf coast.

The taxonomy was subsequently revised again by Atwood and other researchers. A 1997 article in the *Wildlife Society Bulletin* on California gnatcatcher taxonomy summarizes these changes. It says that the California gnatcatcher, *Polioptila californica* Muscicapidae occurs throughout Baja, north to about 34° latitude, and that our listed critter, *Polioptila californica californica* is a subspecies of this more broadly distributed species. Biologists get used to this. Seems like half the polysyllabic species names I learned in college have since been changed. Sigh. So I learn the new ones. But of course when the regulations depend on taxonomy, things can get complicated.

Nature, of course, doesn't classify itself according to species, that's just how we look at things. For example, lions and tigers **can** actually produce viable offspring (and have in zoos). In nature they never would. Even if they were not entirely geographically isolated, their habits are too different for any interbreeding to occur. Thus they are "reproductively isolated." Given the

1) distinct genetically-based morphology,
2) geographic separation, and
3) distinct behaviors

of these two cats, no taxonomist would be likely to argue the two should be considered one species. Other animals can be more difficult, and lets not even get into plants because hybridization is rampant among species in the same family. We'll just ignore funguses, protists, and bacteria altogether because that's areal taxonomic nightmare.

How much interbreeding can there be and still consider species distinct? Should morphological difference be a deciding factor? Before genetic techniques, morphological differences and guesses about interbreeding were all there were to go by; however now gene frequencies can aid in separating species and subspecies.

Taxonomy is a difficult discipline and the intriguing people who deal with this subject are generally divided into two types: lumpers and splitters. Lumpers tend to say, if there is **any** interbreeding, it is all one species, whereas splitters say you can have a degree of interbreeding and still have distinct species. Splitters also look deeper into distinctions between populations and concern themselves with "subspecies" to a greater degree than lumpers.

A subspecies can be likened to a "variety" or a "geographic race." Using biospeak, "an aggregate of phenotypically similar populations of a species inhabiting a geographic subdivision of the range of the species and differing taxonomically from other populations of the species." This rather circular definition can be translated something like: a group that looks alike and lives in a subset of the range of the species. How distinct the geographical range needs to be has not been defined. By the way, those morphological traits, phenotypic characteristics, need to be heritable, not environmentally-induced. As a rule, there should be several traits, identified by multiple alleles (sets of genes coding for a trait), but there are no established criteria as to how many traits there need to be. There is no clear limit to the number of subspecies that could be identified, and lumpers tend to think they are not useful. For example, one taxonomist noted, "In spite of much work done by

fine geneticists and even systematists, present applications of the subspecies concept are uneven, frequently undocumented, and lead to no improvement of either evolutionary theory or practical taxonomy."

The specialists in any one particular species tend to become attuned to nuances in morphology and behavior, and take note when differences are related to selective breeding. Studies on the California gnatcatcher indicated to Atwood and to Mellink and Rea that the distinctions were sufficient to be considered a "subspecies," from a "scientific" perspective. Probably everyone agrees that lions and tigers are separate species, but not everyone agrees *Polioptila californica californica* should be considered a subspecies. For one thing there is a possibility that the morphological (phenotypical) characteristics being studied are related to environmental factors and are not heritable traits, and for another, the subspecies are not very geographically isolated and there is likely to be significant gene flow between them. On the other hand, conservationists may find this subspecies distinction useful in efforts to protect genetic diversity.

The Endangered Species Act provides for the listing of species, subspecies, and even distinct population segments. Thus, the subspecies *californica*, which occurs in the more highly disturbed, urbanized, coastal part of the range, was more easily shown to be threatened with extinction.

II. California Gnatcatcher Listed as Threatened.

On September 17, 1991 a proposed rule to list the gnatcatcher (*Polioptila californica californica*) was published in the Federal Register, and the subspecies was listed as threatened in March 1993. The listing was challenged because the Service had not requested Mr. Atwood's peer-reviewed data, and did not make the data available for public inspection. The District Court vacated the listing. Atwood made his data available and in June, 1994 the Service made the data available for review. The Service also re-instated the listing while accepting comments on the data, and eventually the comment period closed and the listing was considered final.

III. Natural Community Conservation Program.

Largely because of the listing, and concerns about loss of habitat and impacts on property rights, in 1991 the State legislature established a Natural Community Conservation Planning (NCCP) Program. This voluntary program is intended to address both developer concerns and habitat preservation. In Orange County, Riverside County, and most of San Diego County (although we call ours the MSCP here in San Diego) the NCCP addresses the protection of coastal sage scrub and all of its constituents, including the gnatcatcher. The NCCP promotes comprehensive regional habitat planning, establishes a Scientific Review Panel to work on this issue, and creates a quicker permitting process, thereby providing an incentive for developers to participate. In addition, it gets developers and conservationists together to discuss their issues and work out compromises. Some developers and some environmentalists continue to find fault with the program, but from my experiences in San Diego, it represents a vast improvement in mitigation planning and habitat protection.

IV. California Gnatcatcher Natural History.

The federally-listed (as "threatened") California gnatcatcher *Polioptila californica californica* is also a "species of special concern" to the California Department of Fish and Game. It is a small non-migratory songbird in the thrush family with a distinctive kitten-like "mew" call. Breeding season is from late February through July. Nests take about 10 days to construct, and are usually made out of grasses, leaves, spider webs and down. Clutch size averages about four eggs, and the incubation period lasts about 15 days, with both parents participating in incubation, and all phases of the nesting cycle. Occasionally a pair will produce two broods in one season. Juveniles stay with their parents for several months following departure from the nest.

Polioptila californica californica's plumage is dark blue-gray on the dorsal side and grayish white on its ventral surface. The male has a black plumage on its head in the summer. Both sexes have a distinctive white eye-ring. It occurs in coastal sage scrub communities in southwestern California and northwestern Baja California - from Los Angeles County south. Studies of habitat preference indicate that sagebrush and flat-topped buckwheat are the primary plants used by gnatcatchers when foraging for insects. The territory size requirements of the gnatcatcher vary with habitat quality. Documented ranges vary from 5 to 45 acres.

The United States population was estimated at between 1,800 and 2,300 pairs, with fewer than 1,000 pairs remaining in San Diego County at the time the listing package was developed, but more recent estimates put the number over 2,500 pairs in coastal California and another 2,800 pairs in Mexico. Using either set of data, most researchers agree there has been a decline in population, primary because of loss of coastal sage scrub vegetation to urban and agricultural development.

V. California Gnatcatcher Habitat.

Gnatcatcher habitat, coastal sage scrub, is composed of low, soft-woody subshrubs up to approximately one meter in height. The most common and abundant subshrub is the California sagebrush (*Artemesia californica*). Co-dominants include flat-topped buckwheat (*Eriogonum fasciculatum ssp. fasciculatum*), laurel sumac (*Malosma laurina*), and black sage (*Salvia mellifera*). Disturbed Diegan coastal sage scrub is more open with a co-dominance of non-native species such as black mustard (*Brassica nigra*) and sawtooth goldenrush (*Isocoma veneta*).

Much of Southern California's original acreage of coastal sage scrub has been developed or modified, primarily because of urban expansion. Additional evidence of the decline of this once common habitat is the growing number of declining plant and animal species dependent upon it. Other sensitive species include orange-throated whiptail, and San Diego horned lizard. These species are federal candidate 2 species (Category 2), considered species of species concern by CDFG, and considered threatened by the San Diego Herpetological Society.

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Exercise 3: South Miramar Landfill (Overview)

History of Site and Environs

Operations at this part of the landfill stopped around 1972.

Physical Features of Site

The site is located along a portion of the south side of State Route 52 and east of the I-805 freeway. The site area encompasses approximately 22 acres of land.

Biota

The landfill site holds six principal vegetation communities. These are chamise, chaparral, and wetland, including disturbed wetland, freshwater marsh, vernal pools and ruderal (disturbed) vegetation.

Ruderal: This community occupies the central portion of the landfill with sparsely distributed weeds, shrubs and herbs. This community takes up about 15.3 acres or ~69.5% of the landfill area.
Chamise: Approximately 25% of the site along an easterly-sloping area consists of relatively undisturbed chamise chaparral, dominated be the plant *Adenostoma fasciculatum.* Scrub oak *(Quercus dumosa,* laurel, sumac *(Rhus laurina)* felt leafed yerba santa, black sage *(Salvia mellifera)* and flat topped golden yarrow *(Eriophyllum confertiflorum).* Mature chamise is densely interwoven. Fires stimulate re-growth by stump sprouting.
Chaparral: about 2.4 Ac (11%) of the site is occupied by undisturbed chaparral. Disturbed chaparral of about 3.6 acres (~16% of the site) is found on the western slopes of the site.
Wetlands: This includes riparian woodland, disturbed wetland and freshwater marsh makes up about .75 acre of the site and is restricted to two channels.
Vernal pools: these are found on the top deck of the landfill and make up about .1acre total basin area (.5% total vegetation). A total of 13 ephemeral vernal pools are located on the top decks. Common vernal pool species inhabit these environments. Three pools are about 5 by 5 meters in size. Three others are around 3 by2 meters in size.
A man-made intermittent drainage channel passes from an adjacent industrial park into, and through the landfill site.
Significant riparian habitat occupies this drainage including native arroyo willow (*Salix lasiolepis*) and Fremont cottonwoods (*Populus fremontii*).

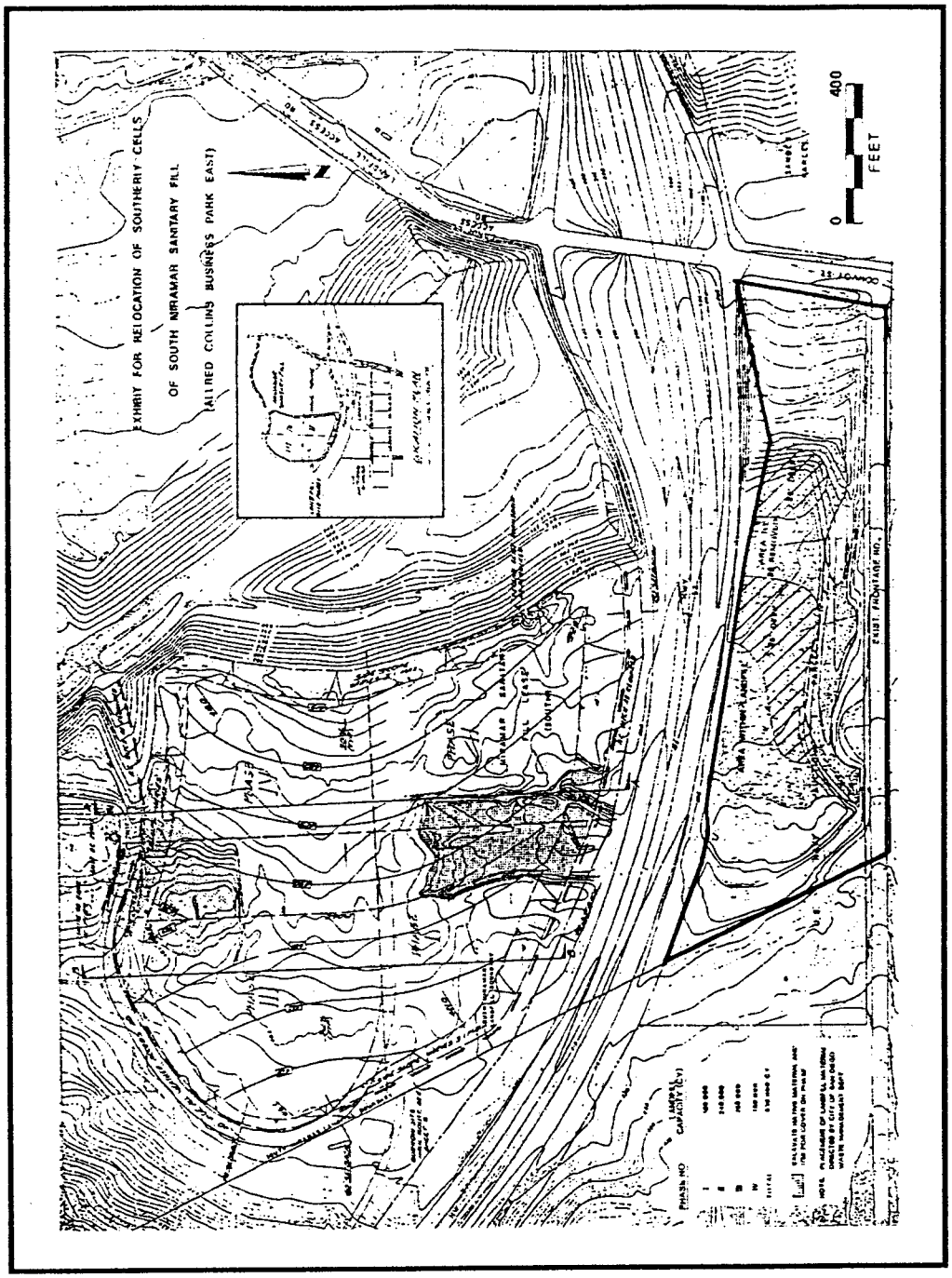
Animals: Amphibians were not observed at the site though common species would be expected. Twenty bird species were observed onsite, including Mourning *dove* (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), scrub jay (*Aphelocoma coerulescens*) common raven (*Corvus corax*), common bushtit (*Psaltriparus minimus*). Mammals would consist of mice, brush rabbit, ground squirrel, Botta's pocket gopher and coyote.

Sensitive species and habitats include two plants, one raptor and one sensitive habitat.

- Sensitive plants include those listed by US Fish and Wildlife Service, CDFG and California Native Plant Society.

  Wart-stemmed Ceanothus*: Ceanothus verrucosus* shrub of buckhorn family.

  Mesa Clubmoss: *Selaginella cinereascens,* considered endangered in this area of its range.
- No endangered animals were noted onsite but federally and state listed bird species have potential to use the site. Several detected, or occurring reptile or bird species are considered declining in the region. Coopers hawk (*Accipeter cooperii*), a sensitive bird species was detected onsite. It is a declining species in state classification and a "species with special concerns" on national level. Loss of riparian habitat is the reason given for decline of this species.
- Reptiles that could use the site include several declining species such as: orange-throated whiptail (*Cnedimophorus hyperythrus beldingi*) San Diego horned *lizard (Phrynosoma coronatum blainvillei*) and two-striped garter snake (*Thamnophis couchi hammondi*)
- Mammals that can frequent the area include the mountain lion (*Felis concolor*), bobcat (*Felis rufus*), ringtail (*Bassariscus astutus*) and southern mule deer (*Otocoileus hemionus fuliginata*). These species are not expected to occupy the project site.
- Sensitive habitats, those which are considered rare for a region are listed in the Conservation Elements of the General Plans for the County of San Diego, 1980 and the city of San Diego,1989. Sensitive habitats of critical concern onsite include the riparian woodland, freshwater marsh, vernal pools and chaparral. These environments are situated throughout the site. Riparian woodlands are located in the area as well as on site. Onsite riparian woodlands are considered underdeveloped and thought not adequate to support sensitive bird species. The freshwater marsh environments are considered somewhat artificial, their water sources provided by adjacent urban runoff. Vernal pools countywide are being threatened by development. The City, County and the State of California regard vernal pools as important sensitive habitats. The US Army Corps of Engineers reviews them under Section 404 of the Clean Water Act, with advisory input from US Fish and Wildlife Service. The vernal pools onsite are "artificially" created by activities on the landfill and subsidence of the top deck. Though they do not exhibit many important characteristics of natural vernal pools, they retain sensitive status.

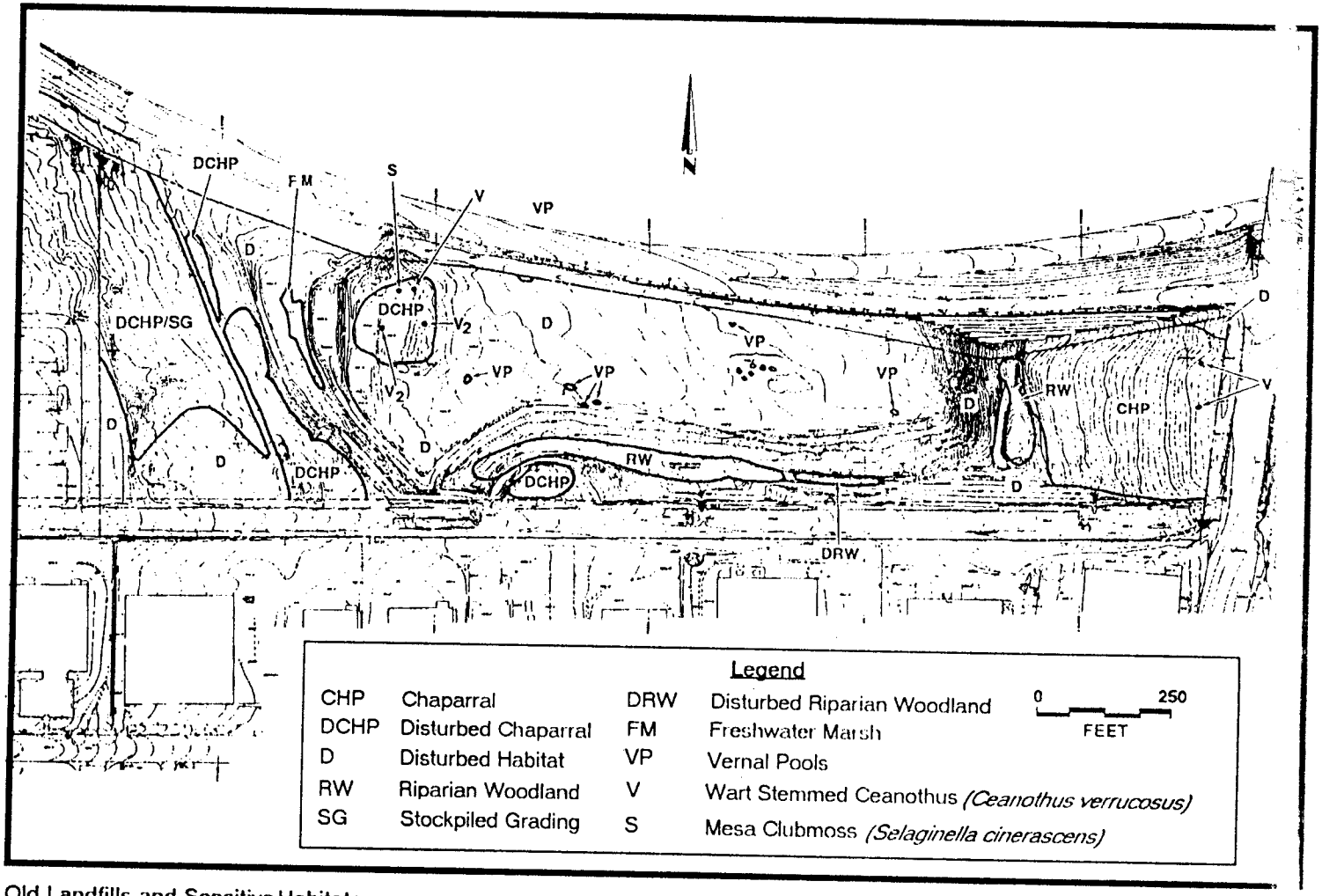


Old Landfills and Sensitive Habitats

South Miramar Landfill General Location San Diego Co.

Area of Sensitive Environmental Resources

From City of San Diego EIR SCH# 88041321



Old Landfills and Sensitive Habitats

South Miramar Landfill Sensitive Habitat Resources

Area of Sensitive Environmental Resources

From City of San Diego EIR 30[illegible]041321